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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,694	09/07/2007	Toshio Yoshihara	920_097	9473

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EXAMINER	
ROBINSON, ELIZABETH A	
ART UNIT	PAPER NUMBER
1787	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,694	YOSHIHARA ET AL.	
	Examiner	Art Unit	
	Elizabeth Robinson	1787	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,24 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 2, 2010 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-20, 24 and 25 are currently pending.

Specification

The amendment filed November 2, 2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendment to Paragraph 118 still retains the word "e.g." in the second line before the cleaner name. This is broader than originally disclosed, since the original specification gave just the cleaner name, not that the cleaner name was an example of cleaners that could be used.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

Claims 1-20, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 2003/0202137) in view of Matsunaga et al. (WO 2004/017105) and Yoshihara et al. (JP 2002-079600).

Regarding claims 1-3, 24 and 25, Nakamura (Paragraphs 116-125) teaches an antireflection film comprising a transparent support (3) and low refractive index layer (2) that is provided on the outermost surface of the high refractive index layer (1). The low refractive index layer has a thickness of 30 to 200 nm (Paragraph 244). The low refractive index layer comprises fine particles (Paragraphs 192-196) such as silica particles having an average particle size of 0.5 to 200 nm, most preferably 5 to 40 nm, and a binder (Paragraphs 209-212). The fine particles are subjected to a surface treatment by a coupling agent (Paragraphs 213-232). This coupling agent can be the same as those the instant application and thus, inherently would provide the same hydrophobitizing of the particles. It is desired that the low refractive index layer have a refractive index lower than the refractive index of the polymer and particle material (Paragraphs 205 and 206).

Nakamura does not teach the silica particles having a void.

Matsunaga (Pages 29 and 30) teaches that hollow silica particles have an effective refractive index of 1.17 to 1.40. This is lower than the refractive index of solid silica particles.

It would be obvious to one of ordinary skill in the art to use the hollow silica particles as in Matsunaga, as the silica of particles of Nakamura, in order to ensure that the low refractive index layer has a sufficiently low refractive index.

Nakamura (Paragraph 265 and Figure 5c) teaches that the low-refractive index layer can have an overcoat layer that covers the unevenness of the surface of the low-refractive index layer and provides a continuous layer (renders the outermost surface smooth). The thickness of the overcoat layer is 1-50 nm (Paragraph 278). Thus, the ratio of thicknesses of the first layer (low refractive index layer) to the thickness of the second layer (overcoat layer) can meet the claimed ratios. The polymer of the overcoat layer is taught in Paragraphs 271-273. These polymers can be the same as the binder in the low refractive index layer (Paragraphs 484-489) and include acrylate components having more than one functional group. Thus, the laminate can have a layer comprising the binder and particles and a layer formed of said binder alone. The polymer for the low refractive index layer (Paragraphs 234 and 235) preferably comprises monomers having two or more ethylenically unsaturated groups and can be acrylates having three or more functional groups. These compounds are curable with ionizing radiation. Nakamura (Paragraph 34) further teaches that the antireflection film should have excellent abrasion resistance.

Nakamura gives a broad range of monomers and includes monomers having less than three ionizing radiation curable functional groups.

Yoshihara (Paragraph 6) teaches a low-refractive index layer coated on a glass or plastic substrate. The composition is an anti-reflection laminate (abstract). The low-

refractive index layer (Paragraph 7) comprises an ultrafine particle whose mean diameter is 5-100 nm and an acrylic compound (binder). Yoshihara (Paragraphs 14 and 15) teaches that trifunctional or greater acrylate components provide a higher crosslinking density and add greater hardness and abrasion resistance to the low refractive index layer.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the trifunctional or higher acrylate monomers of Yoshihara, as the acrylate component the low refractive index and overcoat layers of Nakamura, in order to increase the hardness and abrasion resistance of these outmost layers of the antireflection film.

Regarding claim 4, since the particles have been provided with a hydrophobic surface treatment they would not be fully wetted with water.

Regarding claims 5 and 6, the binder resin of the low refractive layer is taught in Paragraphs 234-235 and includes ionizing radiation curing resins containing hydroxyl functional groups.

Regarding claim 7, Nakamura (Paragraphs 484-485) teaches that the low refractive index layer can have a fluorine or silicon series containing compound.

Regarding claim 8, Nakamura (Paragraph 488) teaches fluorocompounds that meet the limitations of the instant claim.

Regarding claim 9, Nakamura (Paragraph 498) teaches that a coating layer can be present in the voids of the low refractive index at less than 70% by volume. It is preferred to increase the molecular weight of the coating layer, in order to lower the

volume percentage of the coating in the voids. The lower volume percentage is preferred, in order to preserve the refractive index of the low refractive index layer. This lubricating coating layer can comprise an organosiloxane (Paragraph 492).

Nakamura does not explicitly teach the values for m and n.

It would be obvious to one of ordinary skill in the art to choose the molecular weight (thus the values of m and n), in order to obtain a desired refractive index for the low refractive index layer, while still providing an external lubrication layer.

Regarding claim 10, Nakamura (Paragraph 498) teaches that a coating layer can be present in the voids of the low refractive index layer and can be comprise a fluorine-containing silane (Paragraph 273) that meets the limitations of the instant claim.

Regarding claim 11, Nakamura (Paragraph 330) teaches that the contact angle with water of the surface of the side having the low-refractive index layer is preferably 90 degrees or more.

Regarding claim 12, Nakamura (Paragraph 243) teaches that the low-refractive index layer preferably has a refractive index of 1.30 to 1.55. This range overlaps the range of the instant claim.

Regarding claim 13, Nakamura (Paragraph 378) should have a low haze percentage, preferably less than 1%.

Nakamura does not teach the surface roughness values for the outer surface of the low refractive index layer.

Yoshihara (Paragraphs 16-17) teaches that a low-refractive index layer should have the surface roughness controlled to a ten point mean roughness of 100 nm or less and an arithmetic mean roughness of 2 to 10 nm in order to obtain a haze of 1% or less.

It would have been obvious to one of ordinary skill in the art at the time of the invention to control the surface roughness of Nakamura to a ten point mean roughness of 100 nm or less and an arithmetic mean roughness of 2 to 10 nm, in order to obtain a haze of 1% or less as taught by Yoshihara.

Regarding claim 14, Nakamura (Paragraph 458) teaches that there can be a hardcoat layer between the base material and the low refractive index layer.

Regarding claim 15, Nakamura (Paragraphs 253 and 257) teaches the polymers and fillers used to form the hard coat layer. The filler is added to the hard coat layer to adjust the refractive index and hardness of the layer (Paragraph 475).

Nakamura does not explicitly teach the refractive index of the hardcoat layer.

However, due to the refractive indices of the polymers and fillers, the materials of the hardcoat layer should provide coatings that meet the refractive index limitations of the instant claim or it would be obvious to one of ordinary skill in the art to vary the filler and filler loading to obtain a desired refractive index and hardness for the hardcoat layer.

Regarding claims 16 and 18, Nakamura (Paragraph 501) teaches that the hardcoat layer can have anti-glare (anti-dazzling) properties.

Regarding claim 17, Nakamura (Paragraph 284) teaches that an antistatic layer can be provided on the transparent support.

Regarding claim 19, Nakamura (Paragraph 125 and Figure 1c) teaches that there can also be a middle-refractive index layer between the transparent substrate and the low-refractive index layer. The refractive index of the middle-refractive index layer is preferably 1.65 to 1.85 (Paragraph 187) and the layer has a thickness of 5-200 nm (0.005 to 0.2 microns) (Paragraph 189).

Regarding claim 20, Nakamura (Paragraph 280) teaches that an antistatic agent can be added to any of the layers or coating solutions of the anti-reflection film.

Response to Arguments

Applicant's arguments filed November 2, 2010 have been fully considered but they are not persuasive.

Applicant argues that the amendments to the specification overcome the specification objections. However, as stated above, the specification amendment is still broader than originally supported.

Applicant argues that Nakamura et al. (US 2003/0202137) does not teach that the binder of the two layers can be the same. However, Nakamura teaches the polymer of the overcoat in Paragraphs 271-273 and teaches the same list of polymers for low refractive index layer (Paragraphs 484-489).

Applicant argues that Nakamura does not teach that the binder of the low refractive index layer is a fluorine-containing polymer. However, the list of polymers for low refractive index layer (Paragraphs 484-489) comprises fluorine-containing polymers.

Applicant argues that Nakamura does not disclose the claimed thickness ratios. However, as stated above, the layer thicknesses for the low refractive index layer and the overcoat layer can be such that the ratios are met.

Regarding arguments over the new limitation for the binder having three or more functional groups, a new rejection over Nakamura incorporating the teachings of Yoshihara et al. (JP 2002-079600) is presented above.

Due to amendments to claim 1, requiring the low refractive to have two layers with the same binder comprising specific functional groups, the 35 U.S.C. 102(b) and 103(a) rejections from the June 10, 2010 Office Action are withdrawn and replaced with those presented above.

Due to amendments to claim 1, requiring the low refractive to have two layers with the same binder comprising specific functional groups, the nonstatutory obviousness-type double patenting rejections over copending Application No. 10/569,363 from the June 10, 2010 Office Action are withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is (571)272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. R./
Elizabeth Robinson
Examiner, Art Unit 1787

February 9, 2011

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1787